Space Weather Forecast

Issued on Monday, 02 October 2023 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-flares throughout. Slight chance of isolated G1/Minor Storm interval, mainly day 1 (02 Oct) or day 3 (04 Oct)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate class flare, peaking at 01/0132 UTC from the southernmost of the two relatively new sunspots on the northeast disc. These emerged through the last 48 hours as a closely coupled pair, with frequent common class flares and a couple of Moderate flares, including the previously mentioned one. Growth of the northernmost one has now largely stalled, but is ongoing within the intermediate spots of the southern one. This spot has also seen consolidation of its leader and trailer spots. There are nine sunspot regions visible and of the other spots, the larger southwestern one is the most notable. This has with a moderately sized leader spot, and also some slight complexity with mixed polarities amongst its intermediate spots.

No Earth-directed CMEs (coronal mass ejections) have been observed.

Solar Wind / Geomagnetic Activity: Solar winds speeds were slightly elevated levels to background, 390-430 km/s. The interplanetary magnetic field remained weak, with its north-south component also weak and variable in direction. Resultant geomagnetic activity was mainly Quiet (Kp 1-2), but with one Active period (Kp 4) 01/0000-0300 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no Solar Radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate with a chance of further isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. The next notable enhancement is most likely day 1 (02 Oct) due to the arrival of the fast winds from a coronal hole, perhaps increasing solar winds to around 500km/s, however this is low confidence. A further coronal hole sourced fast wind may then follow, perhaps day 2 (03 Oct) but most likely day 3 (04 Oct). While more likely to connect due to its location, this is a smaller and newer feature, with low confidence for the strength of any connection. Mainly Quiet geomagnetic activity expected with isolated Unsettled spells. Any fast wind arrival has the potential to bring a spell of Unsettled to Active, with a slight chance of G1 Minor Storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at Background levels, with no Solar Radiation storms expected.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	20	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	55	55	50	45
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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